Modeling resilient modulus and temperature correction for Saudi roads

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Abstract: Temperature is one of the most important factors affecting the design and performance of pavement. Temperature variations within the pavement structure contribute in many different ways to distress and possible failure of that structure. The structural performance of pavements is highly dependent on temperatures to which these pavements are exposed. Under loading conditions, the pavement temperature is a major factor affecting the deformation response of bituminous structures. The load-spreading characteristics depend on the moduli of temperature-sensitive layers whose strength is significantly reduced by increased temperature. Variations of temperature across pavement depth must be considered in the back-calculation of flexible pavement layer moduli. This paper presents the results of a comprehensive study that was carried out to explore trends of temperature variation in an arid environment and their implications on the moduli of flexible pavements. Temperature correction factors and resilient modulus estimation equations from basic material physical properties were developed using statistical procedures to a high degree of reliability.